

20000619.ba v02_n929.bam.20000619

>From ???@??? Mon Jun 19 18:44:24 2000 -0500
Message-Id: <200006192342.e5JNg4M14278@sco.theporch.com>
Date: Mon, 19 Jun 2000 18:41:45 CDT
From: Old Tube Radios <boatanchors@theporch.com>
To: Old Tube Radios <boatanchors@theporch.com>
Subject: BOATANCHORS digest 2929

BOATANCHORS Digest 2929

Topics covered in this issue include:

- 1) WTS: <http://www.edebris.com/Western-Electric-chrome-push-button-radio/> \$75 plus ship
by "Bob Duckworth" <wb4mnf@atl.org>
- 2) Re: Zenith Radio Parts Needed
by Al Klase <skywaves@bw.webex.net>
- 3) fs: Zenith rotating Wavemagnet antenna-in-a-box
by "DavidC" <eDoc@netzero.net>
- 4) AC/DC sets I should have remembered.(long)
by "Al Fritsche" <fritsche@email.msn.com>
- 5) Re: Halli HT32/37 Parts
by Arden Allen <gumbear@pacbell.net>
- 6) Still Smokin' in Cambridge
by "Richard W. Solomon" <w1kszt@tiac.net>
- 7) Re: Western-Electric-chrome-push-button-radio
by Arden Allen <gumbear@pacbell.net>
- 8) FS parts-the rest of the SK EE's stuff
by Scott Robinson <spr@earthlink.net>
- 9) FS -- HV mica caps
by Scott Robinson <spr@earthlink.net>
- 10) RE: Solvent for Loctite, et al. ?
by "Jim Berry" <basalop@gte.net>
- 11) Re: Solvent for Loctite, et al. ?
by "Barry L. Ornitz" <ornitz@tricon.net>
- 12) FS: Jackson 'scope
by Avery Comarow <acomarow@usnews.com>
- 13) Help with DX-100 in Seymour TN
by "Grant Youngman" <nq5t@home.com>
- 14) Re: ENIAC components list
by "Prof. Arthur I. Larky" <ail0@lehigh.edu>
- 15) Re: ENIAC components list
by "Nick England" <nich@3rdtech.com>
- 16) RE: ENIAC components list
by "Ed Tanton" <n4xy@att.net>
- 17) Re: Solvent for Loctite, et al. ?
by Jack Harper <jharper@bsi2000.com>

- 18) Persistence pays again
by cswiger <cswiger@wilma.widomaker.com>
- 19) Lancaster aerial ?
by BEN NOCK <G4BXD@compuserve.com>
- 20) German people's radio
by philip mccooy <dgnova@erols.com>
- 21) Plastics and solvents
by "Barry L. Ornitz" <ornitz@tricon.net>

Message-Id: <200006181502.LAA06211@hat-trick.atl.org>
From: "Bob Duckworth" <wb4mnf@atl.org>
To: Old Tube Radios <boatanchors@theporch.com>
Subject: WTS: <http://www.edebris.com/Western-Electric-chrome-push-button-radio/>
\$75 plus ship
Date: Sun, 18 Jun 2000 11:02:29 +0100

And you thought the mil contractors had no sense of STYLE!
<http://www.edebris.com/Western-Electric-chrome-push-button-radio/>
\$75 plus ship.
What you see is what you get.
Worked last time I tried here but filter cap got way too hot to leave on for
long.
-bob

Message-ID: <394D2FE6.D4DF164C@bw.webex.net>
Date: Sun, 18 Jun 2000 16:24:06 -0400
From: Al Klase <skywaves@bw.webex.net>
MIME-Version: 1.0
To: Old Tube Radios <boatanchors@theporch.com>
CC: Old Tube Radios <boatanchors@theporch.com>
Subject: Re: Zenith Radio Parts Needed
Content-Type: text/plain; charset=us-ascii
Content-Transfer-Encoding: 7bit

knepper wrote:

>

> I am repairing an old pre-W.W.II Zenith that needs belts -

I've had good luck with large O-rings from the bearing
store in my Walton's set. (Zenith 12S232)

Al

--

Al Klase - N3FRQ
skywaves@bw.webex.net

Flemington, NJ 08822

Web Page: <http://www.webex.net/~skywaves/home.htm>

Message-ID: <011801bfd968\$46a4e0e0\$103843d8@oemcomputer>
From: "DavidC" <eDoc@netzero.net>
To: Old Tube Radios <boatanchors@theporch.com>
Subject: fs: Zenith rotating Wavemagnet antenna-in-a-box
Date: Sun, 18 Jun 2000 17:00:45 -0400
MIME-Version: 1.0
Content-Type: text/plain;
 charset="iso-8859-1"
Content-Transfer-Encoding: 7bit

I have a Zenith rotating Wavemagnet antenna-in-a-box
that connects to the top of the Zenith 8A02 receiver chassis.

It is contained inside of a box properly festooned with the old Zenith
logo, etc. It is large, 17 tall, 9 wide, 4 thick, the rotary connector
comes out the bottom and the wires with connector are there. It isn't
cosmetically perfect but is OK and looks impressive -- I'd love to see
it on the receiver and in action!

If you don't have the receiver it is fun just for looks on a bookshelf. If
you have the receiver this probably completes it.

- Thanks! & 73, DavidC K1YP in Hudson, FL

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<http://www.netzero.net/download/index.html>

Message-ID: <003501bfd976\$815d31c0\$381a273f@noname>
From: "Al Fritsche" <fritsche@email.msn.com>
To: Old Tube Radios <boatanchors@theporch.com>
Subject: AC/DC sets I should have remembered.(long)
Date: Sun, 18 Jun 2000 17:41:40 -0500

Hi Gang, Not a member anymore and don't like to post very often because of
it.

But thought I might past this hint to all newbies and help save some
grief...

In the past I try yearly to take all my mini boats, etc down to the bench and let them stew for a day to keep the elecs formed.

This has always worked fine with a dipole or to my old Butternut HF6V which had a counterpoise kit and floated from DC grnd.

Well a couple of months ago I took down the HF6V and put up a new Cushcraft R-8 Vertical... Works great for what they are, but should have realized that it was at dc grnd and RF decoupled to grnd thru a small choke...

So last week I decided to take my little S38-c down for it's yearly bath (Gift for Christmas from my wife a few years ago).

Well ,hooked a hunk of wire to it and let it play awhile on BC band...Everything was rosey.

Then decided to see what was out there on the higher bands... So I had a short piece of RG58 with a PL 259 connected on one end and at the other end to 2 alligator clips and hooked that up across A1 and grnd

Signals seemed weak, so I said to self, Self, let it set for a while and lets see what happens... Band conditions haven't been great lately.

Went in the house, got an 807 and chatted with the XYL, Went back to the garage and it was full of smoke, I leaped for the power cord and yanked it out...

Well, after dismantling, the input side of L1 of the convertor input coil had gone to RF Heaven...

Then I remembered that I had never put a Polarized 2 wire plug on this little canoe.

So looking at the schematic, I realized that with the polarity wrong on the AC plug, I was putting 125 VAC from the Chassis grnd thru a segment of the input side of the primary of L1 , which is the coil into the convertor section (Chassis to Ant A1 Terminal) then flowing up to the R-8 and going back to DC grnd thru the decoupling coil and then back to the grnd of the bulkhead connector...

Someone correct me if my thinking is wrong here.. PLEASE

So right or wrong about the above.... Please remember to , either use a polarized 2 wire plug on your little canoes or the best is an Isolation transformer which can easily be built from junk or ratshack transformers...

Happy Fathers Day

Al Fritsche
KD5CML
fritsche@msn.com

Date: Sun, 18 Jun 2000 16:29:11 -0700
From: Arden Allen <gumbear@pacbell.net>
Subject: Re: Halli HT32/37 Parts
To: Old Tube Radios <boatanchors@theporch.com>
Message-id: <0FWD000F4IK1DU@mta6.snfc21.pbi.net>
MIME-version: 1.0
Content-type: text/plain; charset=ISO-8859-1
Content-transfer-encoding: 7bit

Hi Frank;

> I'm looking to purchase the heater resister from a Hallicrafters HT32 or HT37
> transmitter parts rig. This is the 4" long wire wound power resister (R171
> 2K 8watt)

If no one has a resistor in his junk box he's willing to part with then look at Ohmite's resistors. Their L50 resistor is 4 in. long and 50 watts dissipation. 8 watts seems low for a 4 inch resistor. If you find what you want go to the home page and check distributor stock to see where to get one.

<http://www.ohmite.com/catalog/270_series.html>

Arden Allen KB6NAX Vallejo, CA gumbear@pacbell.net

Message-ID: <01BFD95C.8CB5B340.w1kszt@tiac.net>
From: "Richard W. Solomon" <w1kszt@tiac.net>
To: Old Tube Radios <boatanchors@theporch.com>

Subject: Still Smokin' in Cambridge
Date: Sun, 18 Jun 2000 19:36:50 -0400

Went to the MIT Flea today, nice sunny day, lots of folks in attendance.
Not much in the BA style ...
Did see an SX-42 (unpriced) a couple of ratty S-38's (look like the same ones I usually see there).
The winner of the Brass plated M-J plant though was the KWS-1K (not sure what the K means). No power supply, and showing its age (lots of dirt/grunge), priced at only \$1000 !!!
Guess he really didn't want to part with it. But it was nice to see one up close.

73, Dick, W1KSZ

Date: Sun, 18 Jun 2000 16:39:17 -0700
From: Arden Allen <gumbear@pacbell.net>
Subject: Re: Western-Electric-chrome-push-button-radio
To: Old Tube Radios <boatanchors@theporch.com>
Message-id: <0FWD00000NJ0IY2@mta6.snfc21.pbi.net>
MIME-version: 1.0
Content-type: text/plain; charset=ISO-8859-1
Content-transfer-encoding: 7bit

Hi Bob;

> And you thought the mil contractors had no sense of STYLE!

Yuk! I don't know about style but that is a sorry looking specimen compared to the BC-603 I bought NIB for \$12 at a Market St. surplus store in San Francisco in '56. Too bad my clumsy attempt to convert it to AM didn't pan out and I eventually reduced it to rubble.

Arden Allen KB6NAX Vallejo, CA gumbear@pacbell.net

Message-Id: <v03007805b57326e0e566@[209.178.166.48]>
Mime-Version: 1.0
Content-Type: text/enriched; charset="us-ascii"
Date: Sun, 18 Jun 2000 17:25:42 -0800
To: Old Tube Radios <boatanchors@theporch.com>
From: Scott Robinson <spr@earthlink.net>
Subject: FS parts-the rest of the SK EE's stuff

<fontfamily><param>Geneva</param><bigger><bigger>Folks,

Well, here's the rest of the SK EE's stuff.

In order to make my life simpler, I'd like to ask you to respond in particular ways:

- 1) Refer to items by their lot ID (a letter in this case)
- 2) Please put your shipping address in your response.

In some cases a given letter ID may consist of several identical pieces. Since no-one may want 7 of the same thing, you can, for example, ask for A and 2 of E. All prices are per piece.

The term "receiver spacing" means the variable capacitor air gap is not conspicuously large. All have 1/4 inch shafts suitable for knobs except as noted.

All prices are plus shipping.

OK, here's the list. Items A-M are all variable capacitors:

- A) 2 pieces EFJohnson 100ED30, dual 100 pF, 0.080 inch plate spacing, \$10
- B) Bud dual 30 pF , 0.040 inch spacing \$10
- C) 170 pF, 0.050 inch spacing \$5
- D) National 100 pF, receiver spacing \$5
- E) 5 pieces 100 pF, receiver spacing, screwdriver adj. 1/4 inch shaft. \$3

- F) 120 pF, 0.10 inch spacing \$5
- G) 5 pieces 100 pF receiver spacing \$3
- H) EF Johnson 30 pF, receiver spacing \$3
- I) 35 pF, 0.04 inch spacing \$3
- J) 30 pF, receiver spacing \$3
- K) 12 pF, receiver spacing \$3
- L) 10 pF, receiver spacing, 1/4 inch screwdriver adj. \$3
- M) Cardwell, dual 20 pF 0.06 inch spacing, new in box. \$20
- N) 7 pieces-box of parts for frequency meter SCR-211-AK, part no. 3Z9825-62.51. Each box contains two ceramic rotary switches. Free.
- P) 2 fists' worth of old wire-wound meter shunts. Free..
- Q) Bud OLS-20 20 M oscillator/buffer coil wih adjustable center link, new in box. \$20
- R) Bakelite plug-in coil forms: 3 pieces 5 pin Bud mfr., 1 piece 4 pin, and 1 ceramic form with grooved ridges, 2 inches dia x 5 inches long with 2 banana plugs mounted to the side. \$2
- S) 3 pieces National 2C4529/C22 coil assemblby consisting of a coil, 2 trimmers, and a mica cap mounted on a steatite base with 5 pins not quite in a row. Some National guru must know what these are for... \$2
- T) About 4 x 4 x 12 inch box of 75 pF +/- 1/5 pF ceramic tubular caps,

made by Erie. Free in smaller lots (may come with other stuff if you ask and I don't get other requests) or \$5 if you want the whole lot. Multiple requests will get these divvied up as there is at least a lifetime supply for any one builder.

U) Right angle vernier worm drive with locking feature, made by GE. Main dial 0-25. vernier dial (edge reading) 0-100. Includes 2/3 of an insulated flex drive. \$15

V) Box of receiving tube sockets, mostly new. Contains 17 ceramic octal sockets and about 50-100 plastic ones, octal, Loktal, and miniature. \$15

To those who asked for stuff from a week or two ago: about half has been sent, and the rest should go out Monday. I'll email you with total cost when I ship stuff and find out the UPS charges. It's a bit of a pain packing and shipping all this, so bear with me.

</bigger></bigger></fontfamily>

Scott Robinson

spr@earthlink.net

Junque is GOOD for you!

Message-Id: <v0300780ab573303b1817@[209.178.165.80]>
Mime-Version: 1.0
Content-Type: text/plain; charset="us-ascii"
Date: Sun, 18 Jun 2000 18:08:16 -0800
To: Old Tube Radios <boatanchors@theporch.com>
From: Scott Robinson <spr@earthlink.net>
Subject: FS -- HV mica caps

Folks,

Here are two items from the first sale that no-one asked for. Surely this is an oversight; the last time I had HV micas they wer much wanted. PRICES ARE REDUCED...

W) NIB 500 pF 8 kV Solar mica cap. \$5

X) 5 pieces 720 pF 2 kV Sangamo mica caps. \$5 for these.

Regards,

/scott

Scott Robinson
spr@earthlink.net

Junque is GOOD for you!

From: "Jim Berry" <basalop@gte.net>
To: Old Tube Radios <boatanchors@theporch.com>
Subject: RE: Solvent for Locktite, et al. ?
Date: Sun, 18 Jun 2000 18:18:50 -0700
Message-ID: <000001bfd98c\$54049ae0\$75030f3f@default>
MIME-Version: 1.0
Content-Type: text/plain;
charset="iso-8859-1"
Content-Transfer-Encoding: 7bit

Hello Grant,

They may have been hit with some kind of "hold it forever" compound, but then again maybe not. See if you can rock the adjustment back and forth. The compound just might crumble away. Don't apply any more force than you would if aligning. Don't want to break something. If my trick does nothing, then follow the other folks suggestions.

73 Jim K7SLI

Message-ID: <006f01bfd9a2\$eb3658c0\$575f62d8@naxs.com>
From: "Barry L. Ornitz" <ornitz@tricon.net>
To: Old Tube Radios <boatanchors@theporch.com>
Subject: Re: Solvent for Locktite, et al. ?
Date: Mon, 19 Jun 2000 00:00:32 -0400
MIME-Version: 1.0
Content-Type: text/plain;
charset="iso-8859-1"
Content-Transfer-Encoding: 7bit

Grant Youngman asked:

> Some previous owner of a new BA, hit all of the coil slugs
> with a red locking compound. This appears to be some
> "hold it forever" version of Loctite, BoltLocker, etc.
> The small bottle of BoltLocker I have indicates it
> contains methacrylic esters. Anyone know what might
> dissolve such stuff?

This sounds like one of the cyanoacrylate anaerobic adhesives (Eastman sold the patents to their cyanoacrylate adhesives to Loctite many years ago). If this is the case, you may not have much luck. Solvents to try, in increasing order of "aggressiveness" (and potential for damage to other nearby components) are acetone, toluene, and methylene chloride. The first two can be bought in most paint stores. The third is a major component in many paint removers. Acetone and toluene are extremely flammable. Toluene and methylene chloride are rather toxic. Avoid breathing the fumes of any of these.

73, Barry L. Ornitz WA4VZQ ornitz@tricon.net

Message-Id: <4.2.2.20000619102312.00aaa170@ntpop.usnews.com>
Date: Mon, 19 Jun 2000 10:29:26 -0400
To: Old Tube Radios <boatanchors@theporch.com>
From: Avery Comarow <acomarow@usnews.com>
Subject: FS: Jackson 'scope
Mime-Version: 1.0
Content-Type: text/plain; charset="us-ascii"; format=flowed

Attention Jackson aficionados! This triggered 5" oscilloscope dates from '62-'63. It is cosmetically excellent--no dings or dents, case and panel 9 or better. It's got a snazzy chrome bezel, for those turned on by such things, with no pitting or corrosion. It works on internal calibration and when external 60Hz is applied. It comes with 3 probes--straight through (with alligator clips), demod, and lo-cap. The latter two are in original boxes with instruction sheets. Sorry, no manual. I much prefer pickup near Washington DC area but will consider shipping. \$40 or best reasonable offer, plus shipping if nonlocal.

Save this 'scope from ebay!

73, Avery W3AVE

From: "Grant Youngman" <nq5t@home.com>
To: Old Tube Radios <boatanchors@theporch.com>
Date: Mon, 19 Jun 2000 09:46:18 -0500
MIME-Version: 1.0
Content-type: text/plain; charset=US-ASCII
Content-transfer-encoding: 7BIT
Subject: Help with DX-100 in Seymour TN
Message-ID: <394DEBEA.3673.376F3985@localhost>

Gents ...

I've received a request from a fellow looking for help getting a DX-100 working. His name is Philip Shults and he is located in Seymour, TN. I have not seen the transmitter, and have no knowledge of its actual condition.

If you are close to Seymour, TN and might be willing to help out PLEASE DO NOT RESPOND TO ME, but respond to Philip directly at PHILIPSHULTSp@aol.com.

Thanks ... Grant

Grant Youngman -- NQ5T
nq5t@home.com
<http://www.globeking.com>
Double Oak, TX (near Dallas)

Message-ID: <394DFEC6.2A5B@lehigh.edu>
Date: Mon, 19 Jun 2000 11:06:46 +0000
From: "Prof. Arthur I. Larky" <ail0@lehigh.edu>
MIME-Version: 1.0
To: Old Tube Radios <boatanchors@theporch.com>
CC: boatanchors@theporch.com
Subject: Re: ENIAC components list
Content-Type: text/plain; charset=us-ascii
Content-Transfer-Encoding: 7bit

Ed Tanton wrote:

>
> In nosing around looking for the specs for a 2N398 germanium transistor, I
> found the following parts list descriptions of certain really old computing
> systems... I thought you all might find this interesting. The URL is:
> <http://ftp.arl.army.mil/~mike/comphist/61ordnance/app4.html>
>

Mike Muuss's main web site <http://ftp.arl.mil/~mike/comphist/> also has plenty of authoritative ENIAC history in it since he's at BRL, the guys who

paid for and used it.

73 & Have Fun,
Nick KD4CPL <nick@3rdtech.com>
<http://www.3rdtech.com/nick/hobbies.html>

----- Original Message -----

From: Prof. Arthur I. Larky <ail0@lehigh.edu>
To: Old Tube Radios <boatanchors@theporch.com>
Cc: <boatanchors@theporch.com>
Sent: Monday, June 19, 2000 7:06 AM
Subject: Re: ENIAC components list
> Sorry to disappoint ENIAC fans, but this is NOT the ENIAC I knew.
> Anyone wants more ENIAC info, email me.
> Art K3HBA
>

From: "Ed Tanton" <n4xy@att.net>
To: Old Tube Radios <boatanchors@theporch.com>
Subject: RE: ENIAC components list
Date: Mon, 19 Jun 2000 11:51:04 -0400
Message-ID: <CKEGICNFDIMCEKEDCEHF0EOPCNAA.n4xy@att.net>
MIME-Version: 1.0
Content-Type: text/plain;
charset="iso-8859-1"
Content-Transfer-Encoding: 7bit

Indeed that's (Ballistic Research Laboratories Electronic Scientific Computer, a 1961-2 machine) what it said above the list, but apparently it had SOME relationship to EINIAC, perhaps only as a distant cousin, for that title was in the top left corner of the page. I'm not surprised EINIAC was different, but still found it very interesting.

73 Ed Tanton <n4xy@arrl.net> K2# 0057 (FT)

Technical Editor QRP ARCI "QRP Quarterly"

website: <http://www.qsl.net/n4xy/>

Message-Id: <4.1.20000619100112.041d1c88@mail.bsi2000.com>
Date: Mon, 19 Jun 2000 10:03:51 -0600
To: Old Tube Radios <boatanchors@theporch.com>
From: Jack Harper <jharper@bsi2000.com>
Subject: Re: Solvent for Locktite, et al. ?
Mime-Version: 1.0
Content-Type: text/plain; charset="us-ascii"

At 12:00 AM 6/19/2000 -0400, you wrote:

<snip>

>>Anyone know what might

>> dissolve such stuff?

>

>

I have the same question for 'epoxy glue' -- the binary stuff that comes in two tubes to be mixed.

Is there something that will dissolve that??

I very much appreciate any information.

Regards,

Jack, W0YJ (Friend to all things Hammarlund)

Jack Harper

BSI2000, Inc.

303-231-9095

Lakewood, Colorado USA

303-898-6126 (Cellular)

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Date: Mon, 19 Jun 2000 12:44:14 -0400 (EDT)

From: cswiger <cswiger@wilma.widomaker.com>

To: Old Tube Radios <boatanchors@theporch.com>

Subject: Persistence pays again

Message-ID: <Pine.BSF.3.96.1000619123207.4519A-1000000@wilma.widomaker.com>

MIME-Version: 1.0

Content-Type: TEXT/PLAIN; charset=US-ASCII

Grid Gurus -

I'd asked about a career guidance book on here some years

ago, named "There's Adventure in Electronics" by Julian May, 1957, Pop. Mechanics press. Well, after a long time of checking abebooks.com one finally turned up, so now I can re-read "Randy Morrow builds a Space Spanner" (and there a 'Spanner parts list and schematic in there too!).

The forward is interesting:

" But between those events my oft-interrupted experiments in attempting to find an entirely new electronic action in a lowly gas burner flame, finally led me to the insertion of a crooked bit of wire, a "grid" as I called it, between a red hot carbon filament and a platinum plate, all inside a miniature glass tube, which my keen-eyed assistant named the "audion."

Lee De Forest

Chuck
kb4new
cswiger@widomaker.com

Date: Mon, 19 Jun 2000 13:03:06 -0400
From: BEN NOCK <G4BXD@compuserve.com>
Subject: Lancaster aerial ?
To: Old Tube Radios <boatanchors@theporch.com>
Message-ID: <200006191303_MC2-A94B-5930@compuserve.com>
MIME-Version: 1.0
Content-Transfer-Encoding: quoted-printable
Content-Type: text/plain;
charset=ISO-8859-1
Content-Disposition: inline

I picked up a very nice trailing aerial drum and ratchet assembly this weekend, one as used on Lancasters etc with the T1154. =

What I don't know is how the wire on the drum, once trailed =
behind the aircraft, was connected to the radio set ? and how it =
was insulated from the a/c body as it exited the a/c.

Though I have several drums this one has the ratchet assembly with a three position control, Brake, Free and Ratchet.

The drum on which the wire is wound is of a bakerlit or

Tufnol type material so is obviously insulated but just how was the wire aerial connected to the J Switch and hence to the radio.

If anyone has a drawing in an AP that shows this I would like a scanned copy of it or by post if easier. =

Thanks es cheers, Ben G4BXD.

Message-ID: <394E7547.AD1B37CC@erols.com>
Date: Mon, 19 Jun 2000 15:32:23 -0400
From: philip mccooy <dgnova@erols.com>
MIME-Version: 1.0
To: Old Tube Radios <boatanchors@theporch.com>
Subject: German people's radio
Content-Type: text/plain; charset=us-ascii
Content-Transfer-Encoding: 7bit

I have uploaded the service manual for the German People's radio at my web site <http://www.Qsl.net/w3sak>

Message-ID: <003f01bfda47\$dcb44c80\$5b5f62d8@naxs.com>
From: "Barry L. Ornitz" <ornitz@tricon.net>
To: Old Tube Radios <boatanchors@theporch.com>
Cc: <jharper@bsi2000.com>
Subject: Plastics and solvents
Date: Mon, 19 Jun 2000 19:41:14 -0400
MIME-Version: 1.0
Content-Type: text/plain;
charset="utf-7"
Content-Transfer-Encoding: 7bit

I know I have answered this before, but questions keep coming up like the one from Jack Harper, W0YJ, wrote:

+AD4-I have the same question for 'epoxy glue' -- the binary
+AD4-stuff that comes in two tubes to be mixed. Is there
+AD4-something that will dissolve that??

Before answering this, let me go back to some basic chemistry of plastics. Plastics are long chain polymers. Polymers, in turn, are collections of molecules joined together in a repeating fashion. For example, polyvinyl chloride is made from a collection of vinyl chloride +ACI-building blocks+ACI- attached to each other to form a chain. The chemical reaction process of joining these blocks

together is called polymerization.

When a polymer is made by connecting these blocks mainly in a linear or chain fashion, the resulting polymer may be viewed as akin to a long strand of spaghetti. It does not have to be straight, but can be folded back upon itself forming loops and twists, etc.

The analogy to a bowl of spaghetti can be extended to show some solubility properties. Imagine boiling a box of individual strands of spaghetti, letting them tangle in the water, and then dumping them out in a colander. Now let it dry. The highly tangled mess is an excellent representation of a thermoplastic polymer.

If you want it to go into solution, you can dump it back into boiling water. The idea is to get every individual strand separated from its neighbor. It should be easy to see that the longer each individual strand is, and the more tangled they are, the more difficult it is to separate them. Likewise in a polymer, the higher the molecular weight, the longer the chain, and the lower the solubility.

Now imagine that instead of forming a linear chain, the monomer building blocks can branch and attach at several locations building up a three dimensional structure. When several linear chain polymers can attach to each other occasionally, the result is called cross-linking. Imagine the bowl of cooked spaghetti, but wherever two strands touch, they now bind permanently to each other. You can see that it soon becomes impossible to separate the strands when much cross linking occurs. Thus you see extremely limited solubility. When this three-dimensional cross-linking occurs throughout the polymer, you reach the point that it becomes completely insoluble in any solvent.

To use the standard jargon for these conditions, we refer to thermoplastic polymers and thermoset polymers.

Thermoplastic polymers soften repeatedly when heated and they harden when cooled. They can usually dissolve in specific solvents. Thermoset polymers, however, become permanently infusible (hard) with temperature, and completely insoluble.

Some examples of thermoplastics are nylon, acrylic, vinyl, styrene, and cellulosic polymers. Thermosets include epoxy, urethane, phenolic, and unsaturated polyester plastics.

The same principles apply to paints which I discussed recently. Oil-based alkyds and urethanes cross-link and become quite insoluble. Lacquers, however, are thermoplastics dissolved in solvents. Once evaporated, the polymer remains, but it can be re-dissolved in the future.

Epoxy is basically not going to dissolve in any solvent. But if we go back to the bowl of spaghetti analogy, it can be seen that if the chemical chain is broken into smaller pieces, these can dissolve. Thus certain very aggressive materials may attack epoxy and destroy it, but they do not really dissolve it.

A good example is the de-encapsulation of epoxy-molded integrated circuits for failure analysis. One of several similar techniques involves +ACI-burning away+ACI- the epoxy with boiling sulfuric acid. The silicon below may not be attacked, but the aluminum bonding wires are sure dissolved+ACE- But this process can hardly be called dissolving the epoxy.

So I cannot offer Jack much hope in dissolving the epoxy. Depending on the material it is bonded to, it +AF8-may+AF8- be possible to chemically attack and remove it, but it depends highly on how resistant the underlying material is to the chemicals to know if the process is suitable.

In some cases, certain solvents may swell and soften a thermoset polymer while not really dissolving it. This may aid in the mechanical removal of the plastic. Given some information about the thermoset plastic and the substrate it is applied to, I can often suggest the most suitable solvents (but many may not be available to the general public). Please email me if you have specific materials in mind.

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End of BOATANCHORS Digest 2929
